

**FIG. 1A CDMA Transmitter Block Diagram**

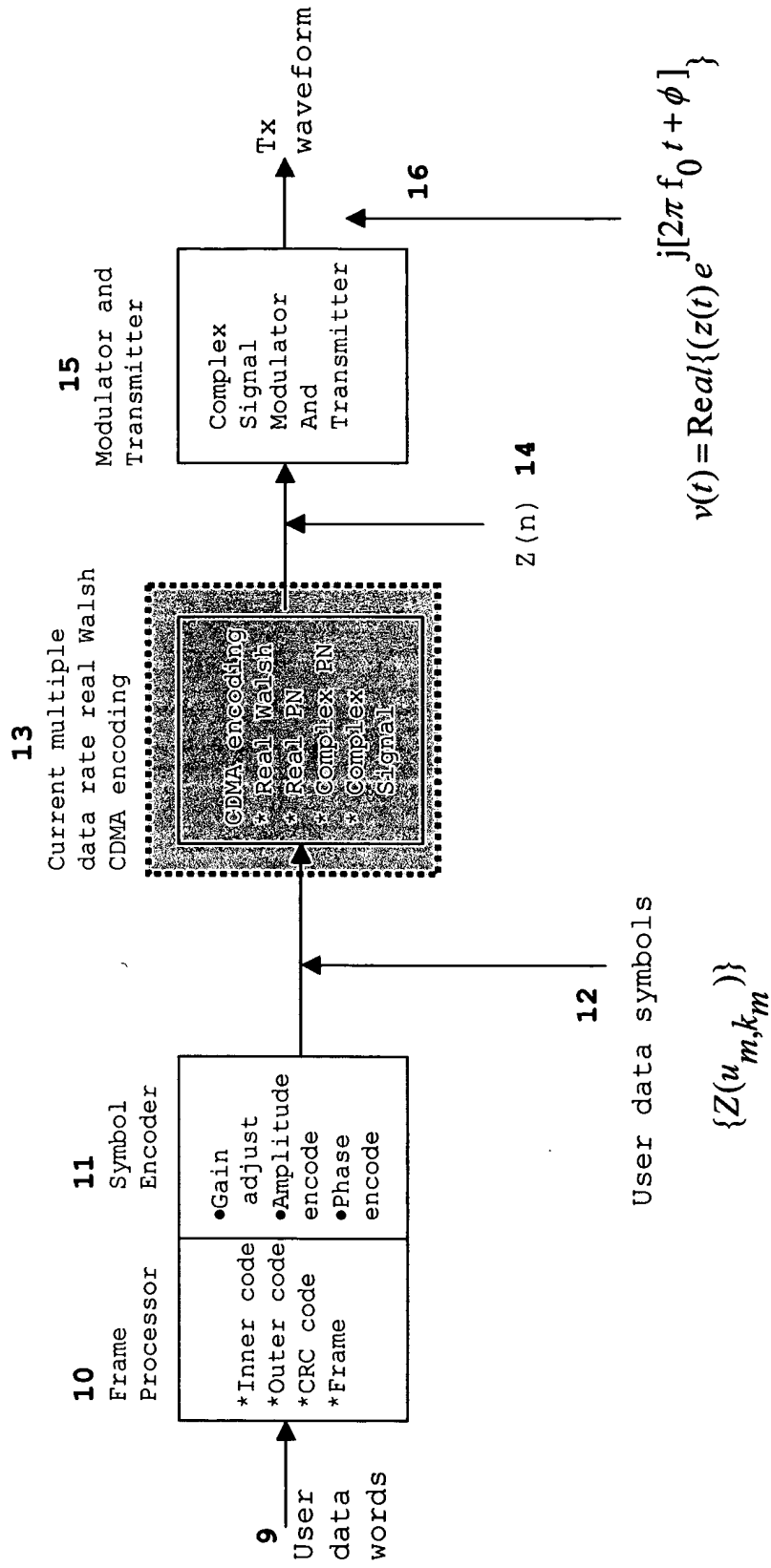


FIG. 1B CDMA Cellular Application

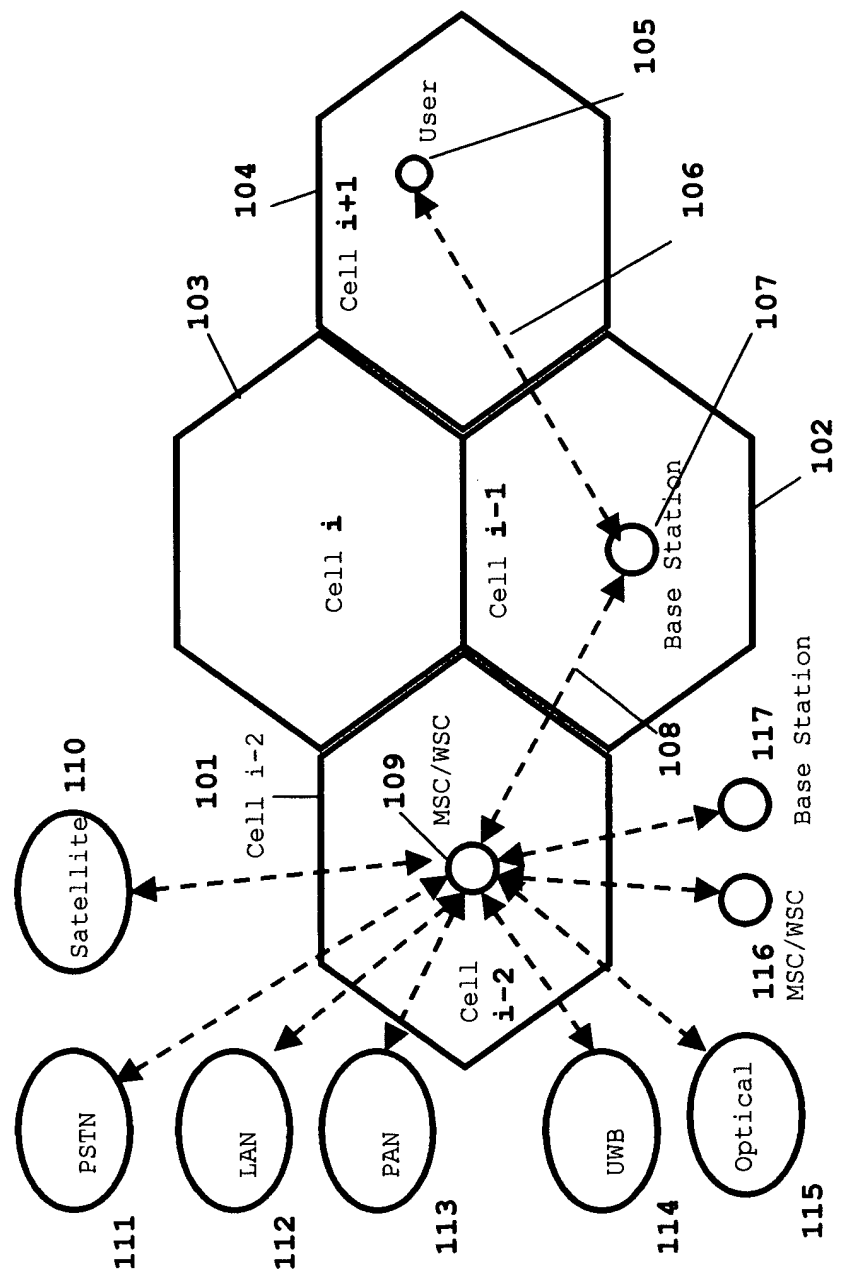




FIG. 1C Cellular Transmitter Implementation: Real Walsh

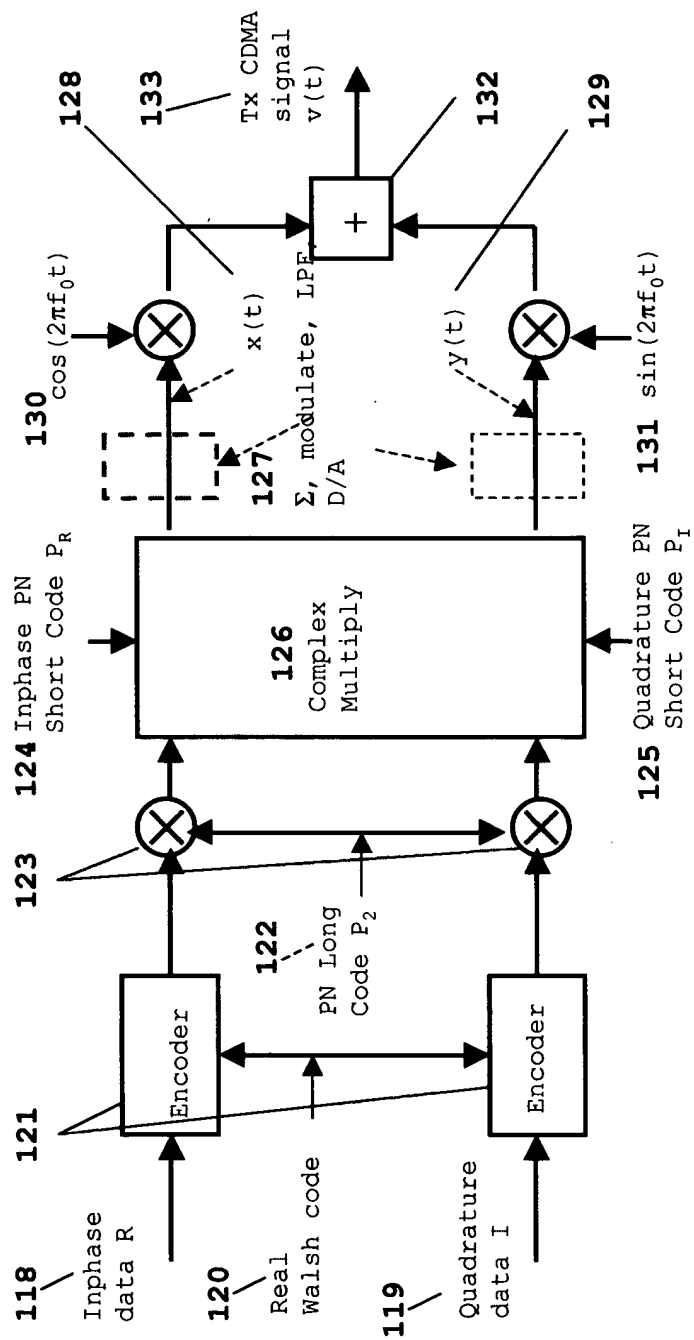
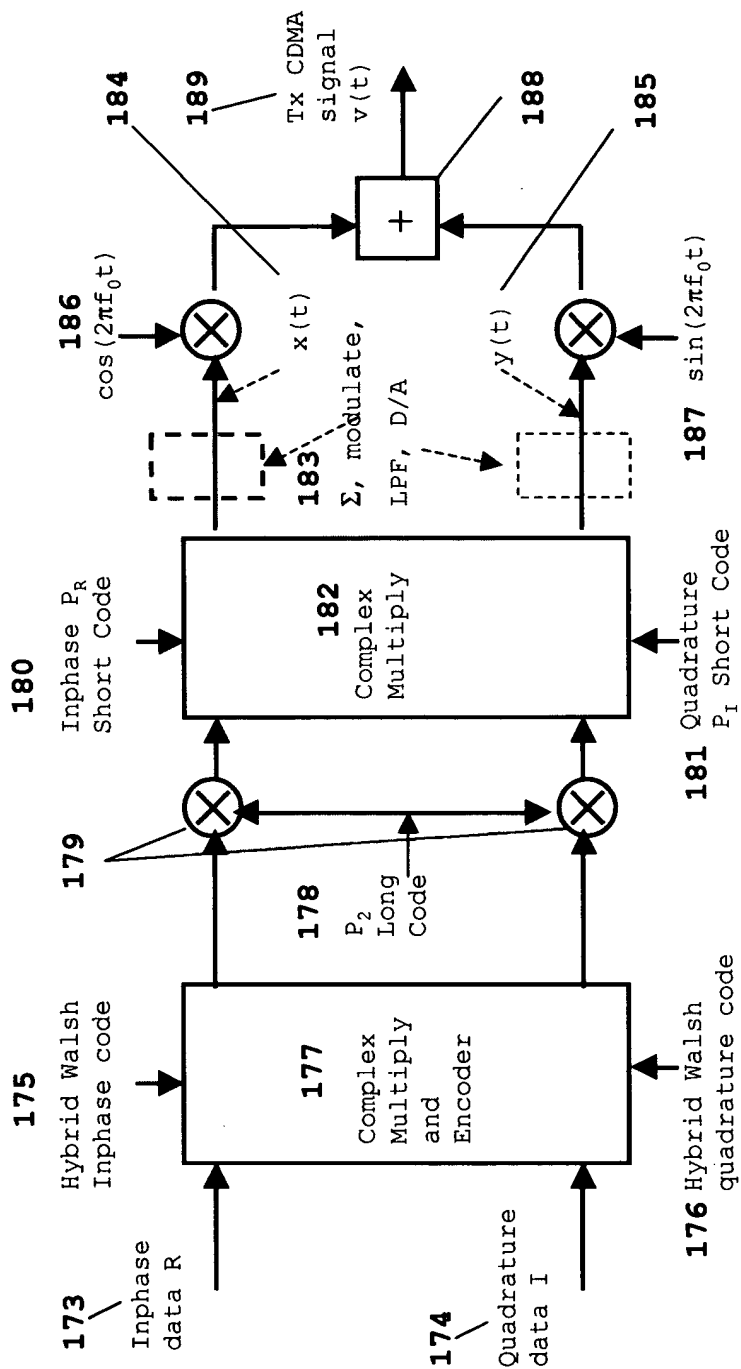


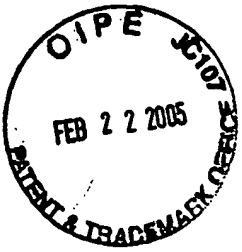


FIG. 1D Hybrid Walsh Implementation Algorithm

Hybrid Walsh Code (Sequence) Index c	Hybrid Walsh lexicographic reordering permutation of the real Walsh code vectors	Hybrid Walsh imaginary (quadrature) code index ci
c=0,1,...,N-1	Hybrid Walsh real (inphase) code index cr	Hybrid Walsh imaginary (quadrature) code index ci
c = 0 c = 1 to (N/2-1) c = N/2 c = N/2+Δc for Δc=1 to N/2-1	cr = 0 cr = 2c cr = N-1 cr = N-1-2Δc	ci = 0 ci = 2c-1 ci = N-1 ci = N-2Δc

FIG. 1E Cellular Transmitter Implementation: Hybrid Walsh





**FIG. 2A Multiple Data Rate Encoder: Real Walsh**

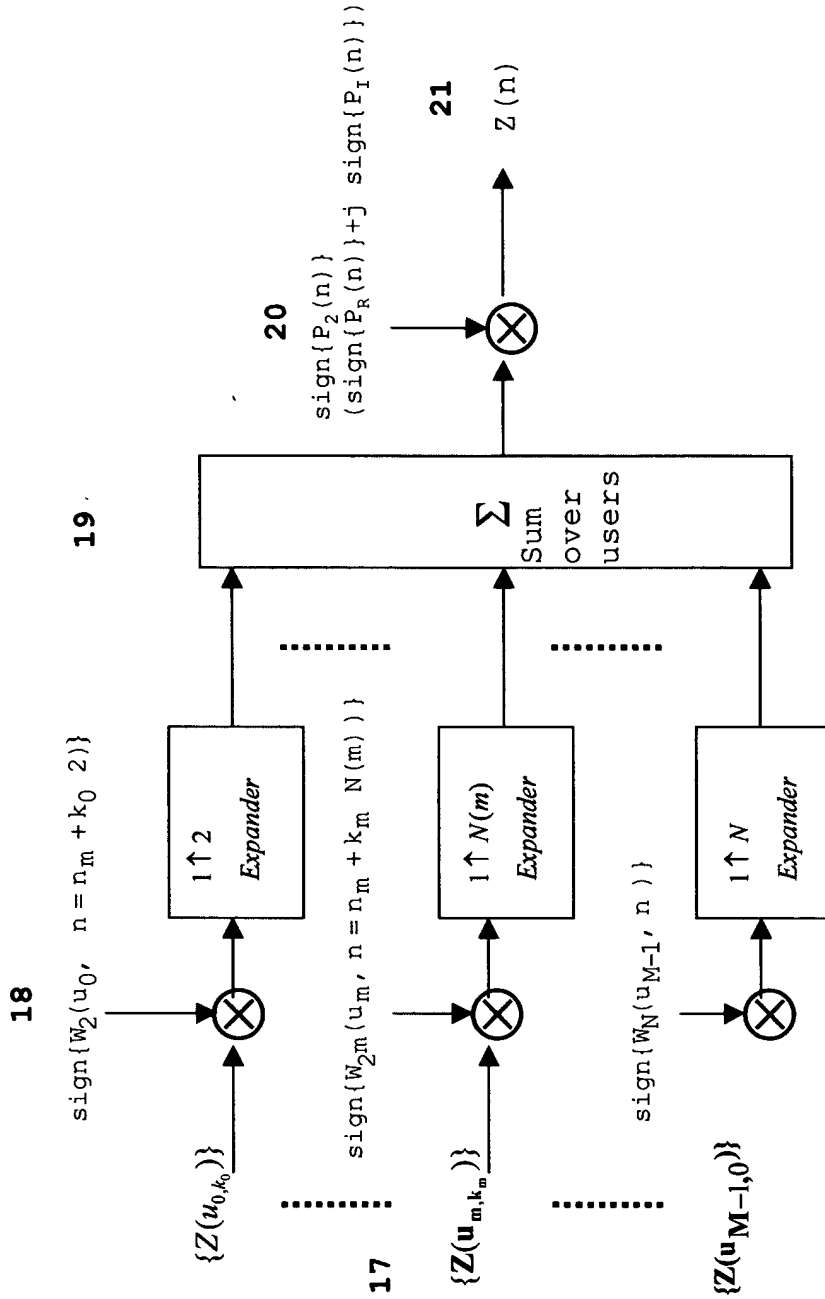




FIG. 2B Multiple Data Rate Encoder: Hybrid Walsh

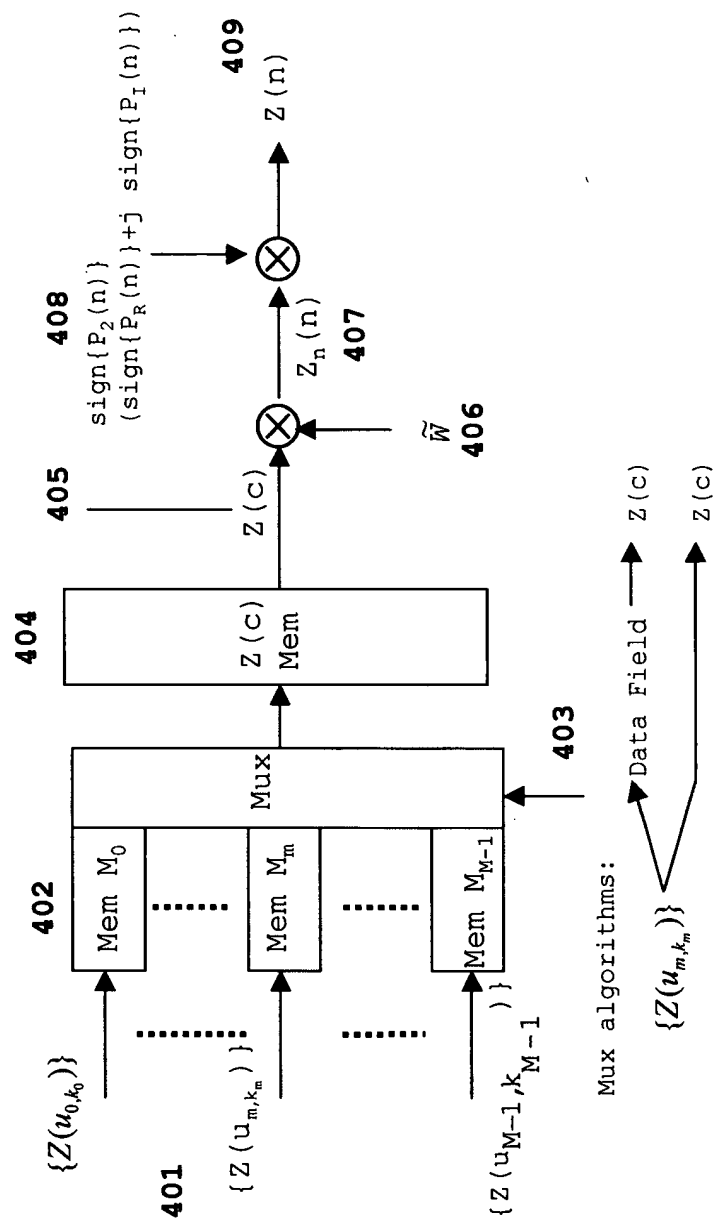
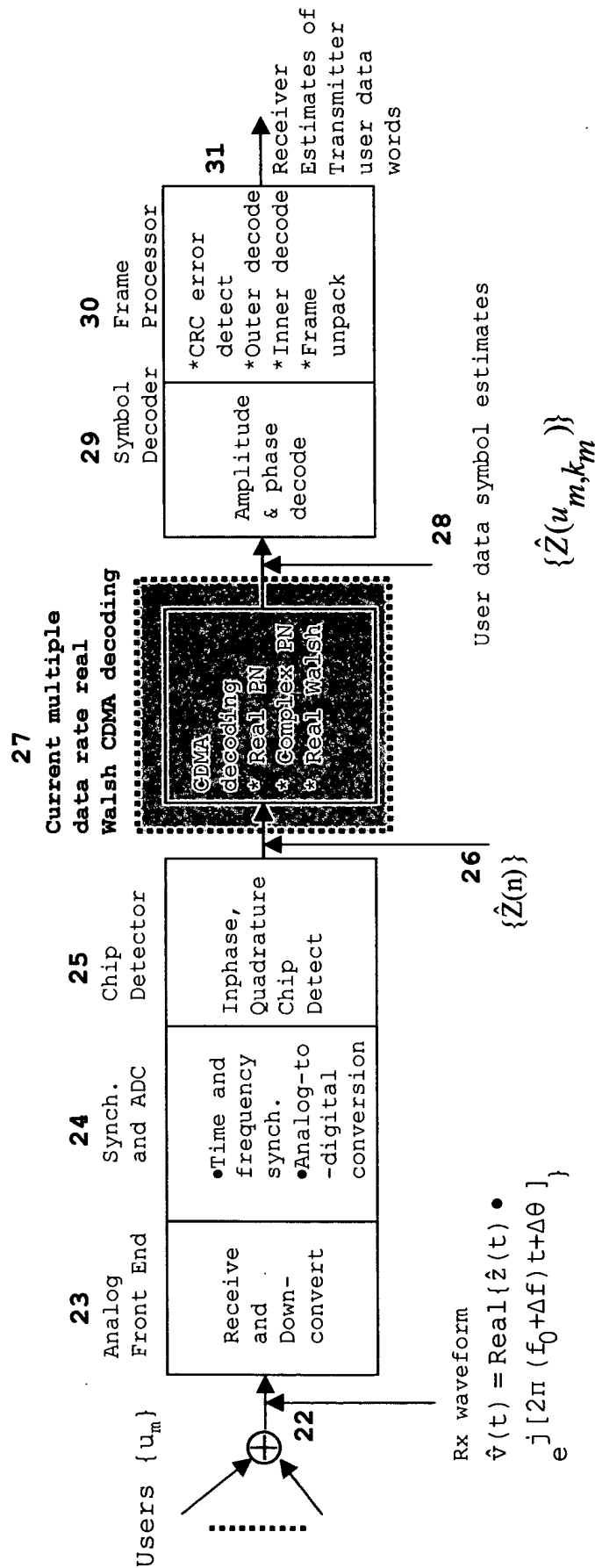
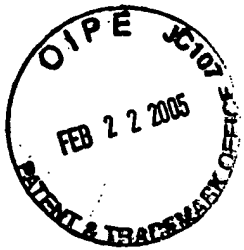




FIG. 3A CDMA Receiver Block Diagram







**FIG. 3B Cellular Receiver Implementation: Real Walsh**

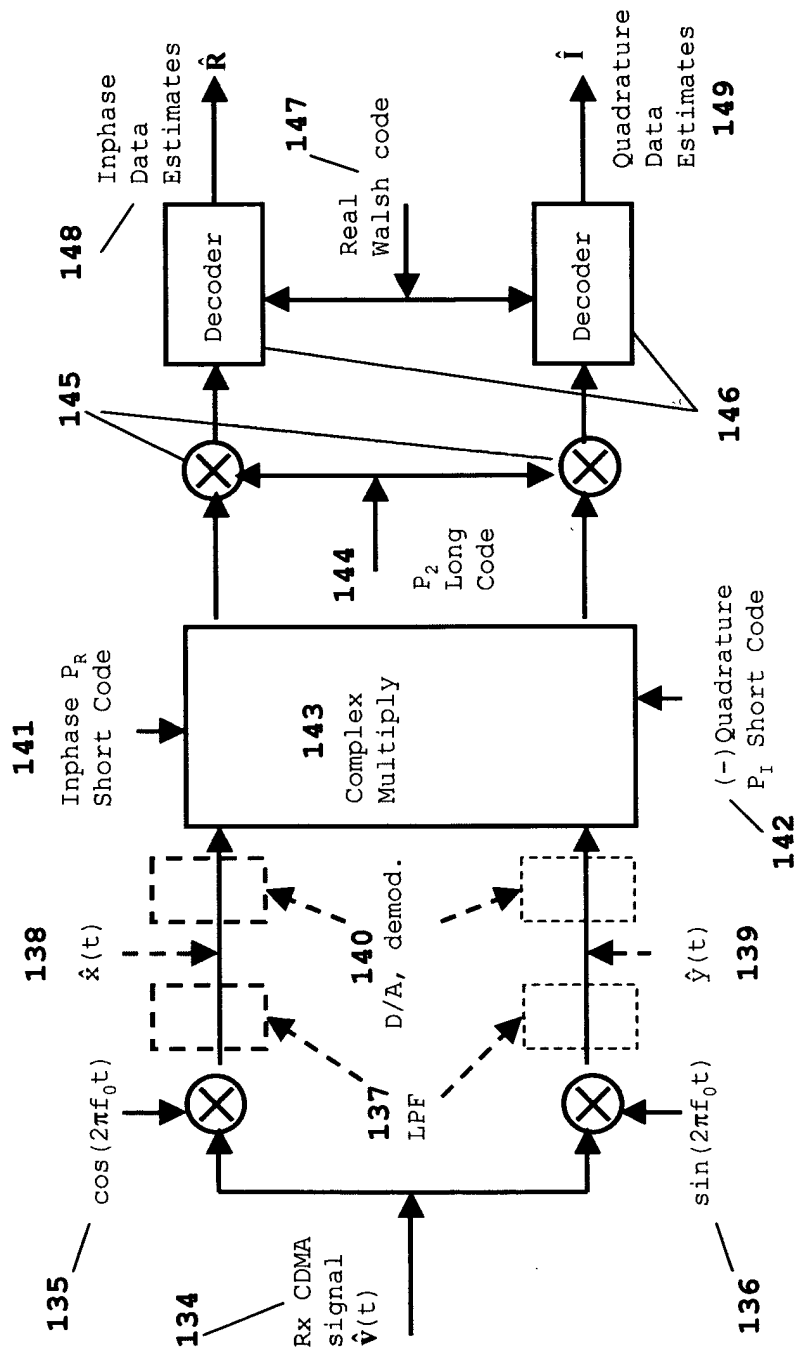




FIG. 3C Cellular Receiver Implementation: Hybrid Walsh

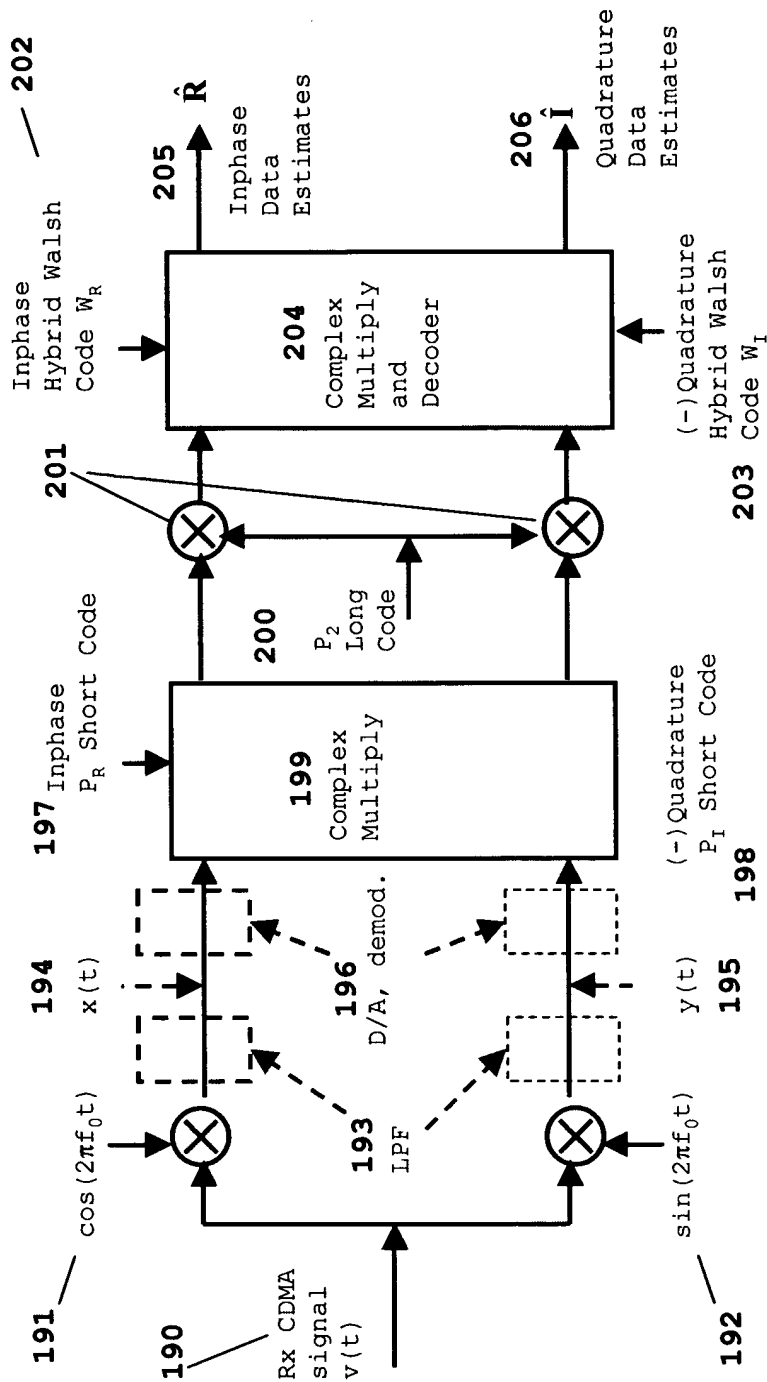


FIG. 4A Multiple Data Rate Decoding: Real Walsh

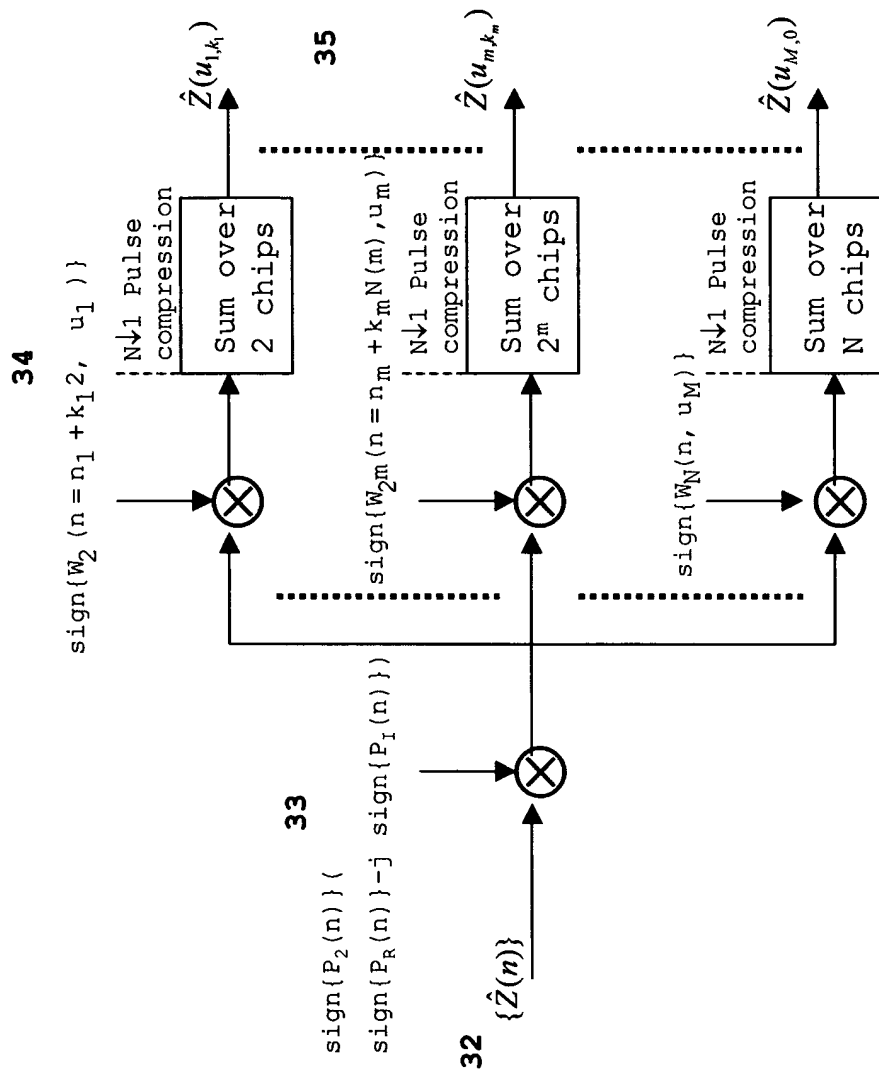
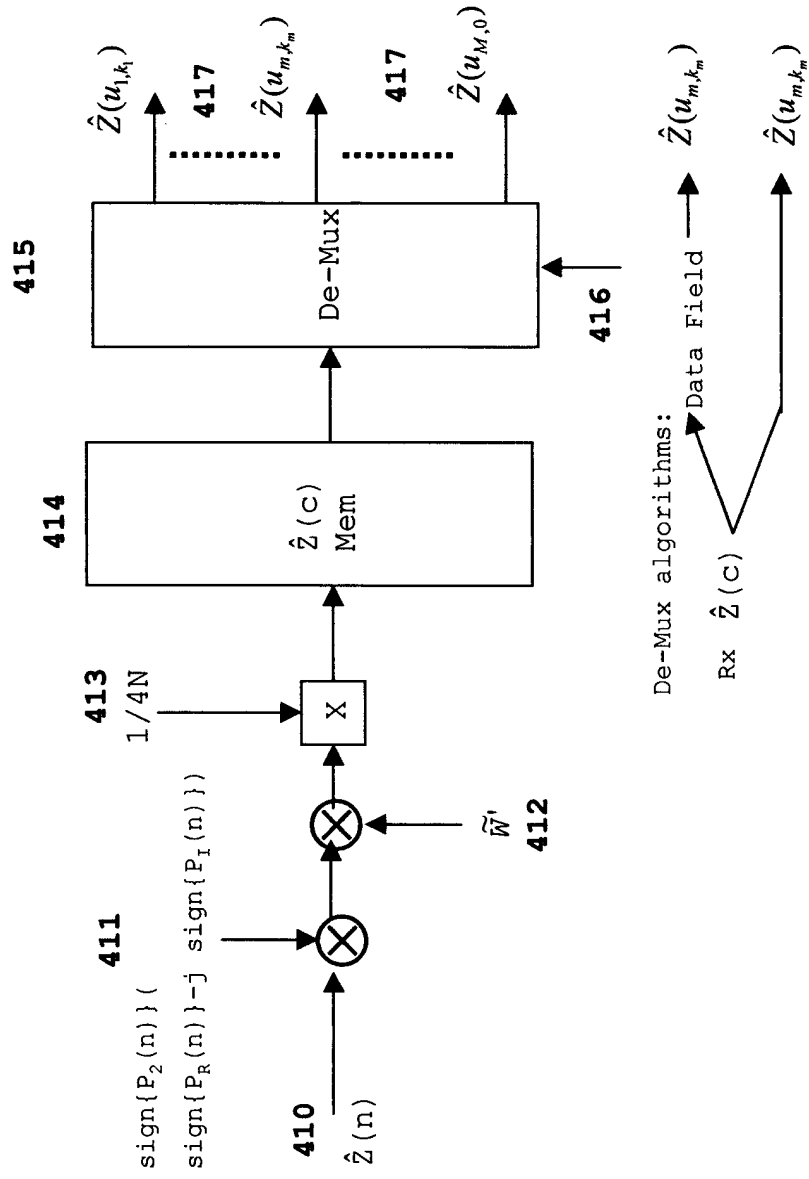




FIG. 4B Multiple Data Rate Decoding: Hybrid Walsh



**FIG. 5A Multiple Data Rate Fast Encoding  
 for Generalized Hybrid Walsh  
 for Example 58 in Equations (10)**

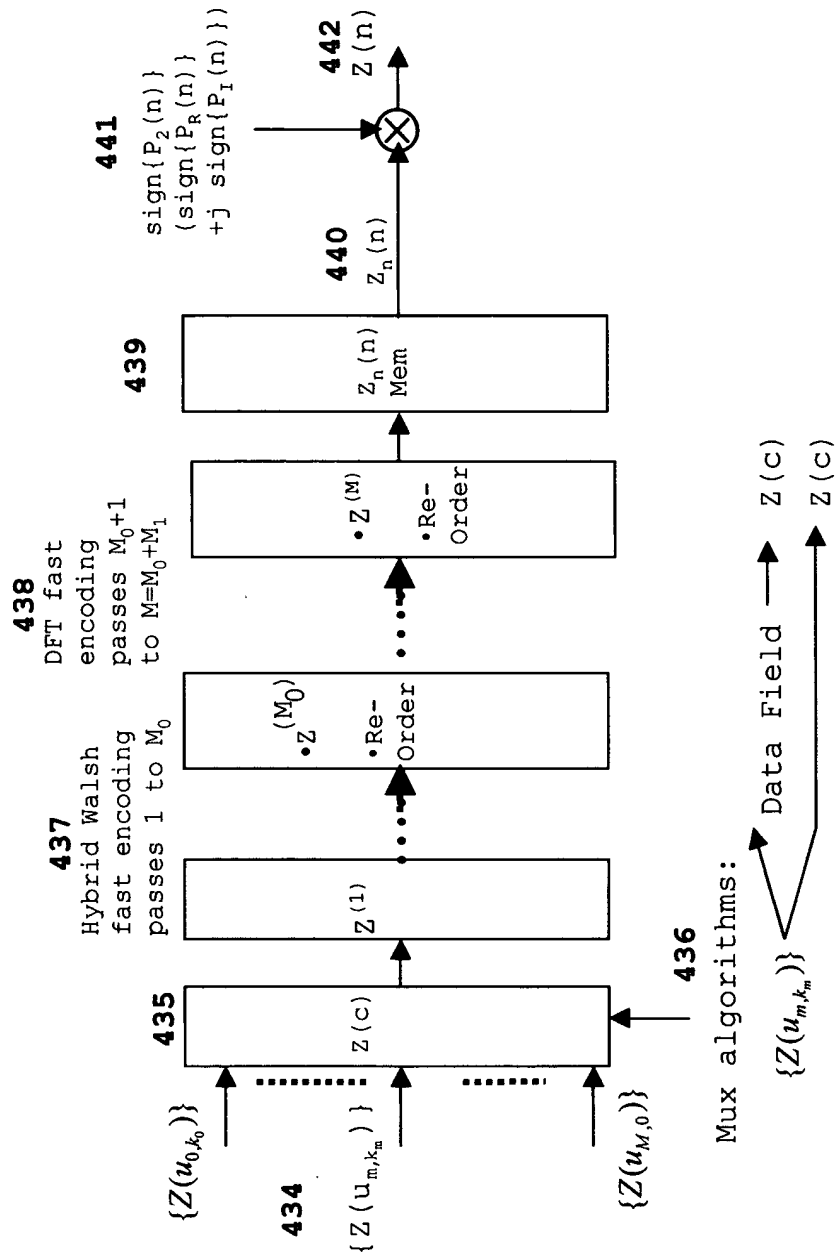
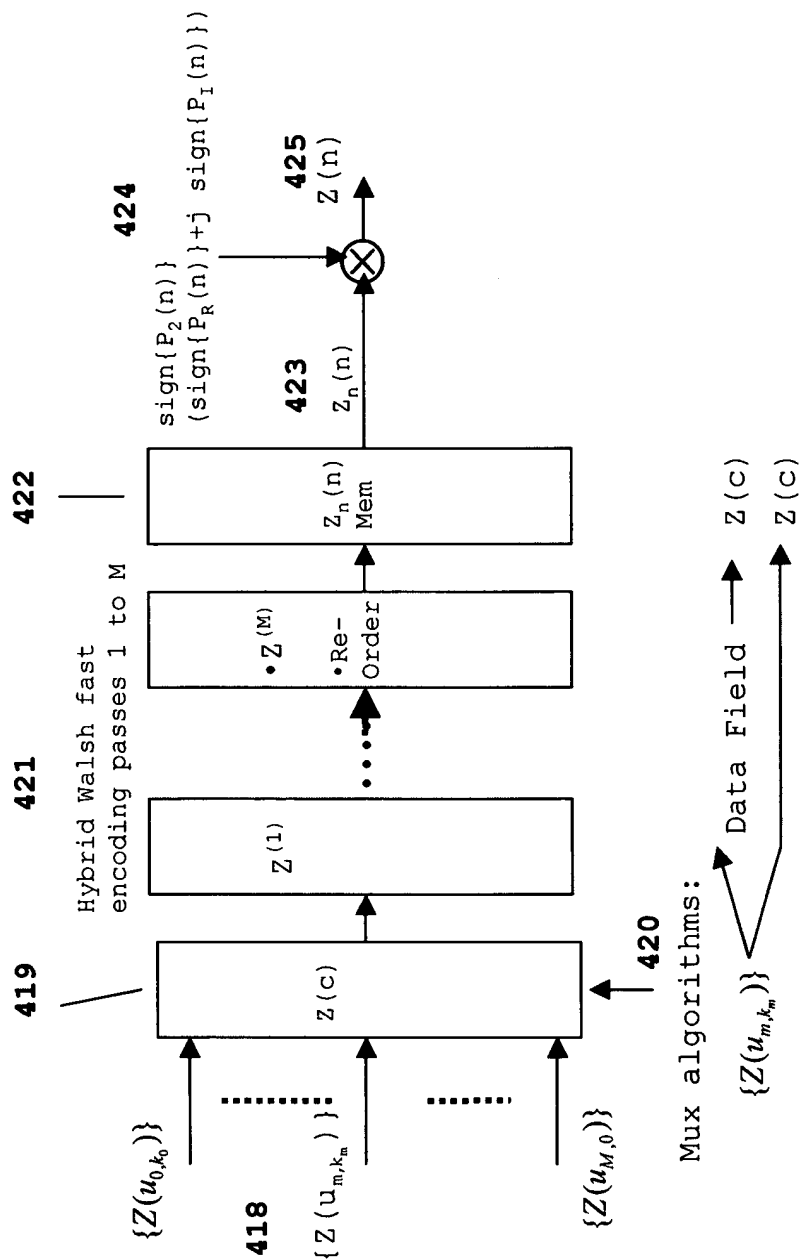
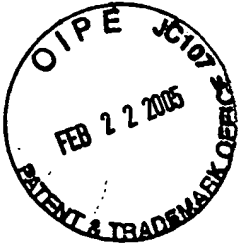
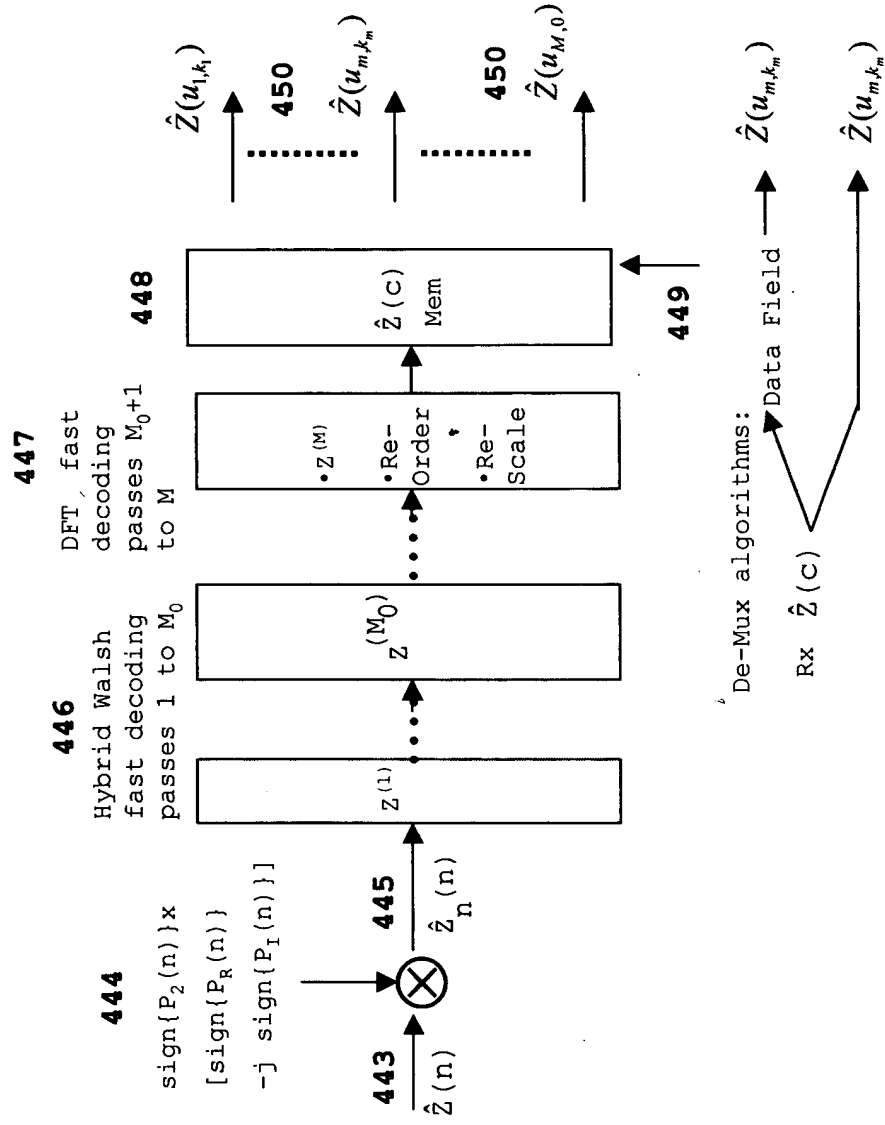


FIG. 5B Multiple Data Rate Fast Encoding for Hybrid Walsh





**FIG. 6A Multiple Data Rate Fast Decoding  
for Generalized Hybrid Walsh  
for Example 58 in Equations (10)**





**FIG. 6B Multiple Data Rate Fast Decoding  
for Hybrid Walsh**

